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Emission Inventory Requirements for Post-1987 Ozone State Implementation Plans

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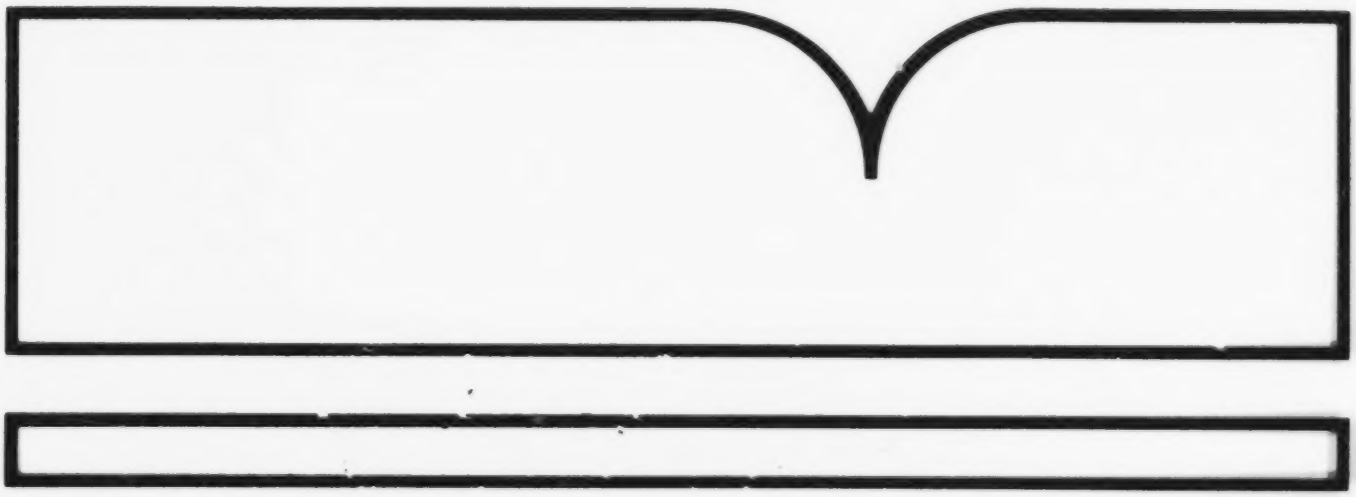

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EMISSION INVENTORY REQUIREMENTS FOR POST-1987 OZONE STATE IMPLEMENTATION PLANS

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This document describes the final emission inventory requirements related to preparation and submission of post-1987 ozone State Implementation Plans (SIPs) for those States required to revise their plans after December 31, 1987.

Addressed in the document are emission inventory requirements relating to geographic area of coverage, point source cutoff size specifications, sources to be included, pollutants of interest, data reporting formats, documentation requirements, quality of data base, years to be addressed, and schedule for inventory submission.

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PREFACE

This document describes emission inventory requirements related to the preparation and submission of ozone (O_3) State Implementation Plans (SIPs) for those areas required to revise their plan after December 31, 1987. Included in this document are a number of improvements and additions to the emission inventory requirements that applied to the 1982 O_3 SIPs. The focus of this report is requirements for base year emission inventories. Although not required until submittal of the SIP, brief discussions of projected emission inventories and reasonable further progress (RFP) tracking are also included for those agencies that choose to begin preparation of this information. More information concerning projected emission inventories and RFP tracking will be issued later in 1989.

Major changes incorporated in this document are summarized briefly below:

- Emissions of volatile organic compounds (VOC), nitrogen oxides (NO_x) and carbon monoxide (CO) shall be inventoried for all counties (or county equivalents) within the metropolitan statistical area (MSA) or consolidated metropolitan statistical area (CMSA), if one exists, in which a nonattainment determination was made. The inventory shall also include emissions from sources in adjacent nonattainment counties and emissions from major stationary sources outside of, but within 25 miles of, the MSA/CMSA boundary. Only sources within the county in which the determination was made were included in previous inventories. The inventory area has been expanded because major sources of O_3 precursors located in areas surrounding the nonattainment area may contribute significantly to the O_3 formation problem in the affected area.

- Emissions of VOC, NO_x and CO shall be summarized on a countywide or equivalent (parish, township, etc.) basis aggregated by source category for both point sources and area sources. The CO emissions information was not required in previous O_3 SIP emission inventories. However, recent evidence from smog chamber studies indicates that CO plays a small, but significant role in ozone production. Reductions in CO, due to automotive and other emission control programs, will reduce O_3 levels and will reduce the amount of VOC control necessary to attain the National Ambient Air Quality Standard (NAAQS).

- In addition to the source category emissions summaries, emissions information shall be compiled and reported for each individual point source within the MSA/CMSA that emits at least 10 tons per year (tpy) VOC and for each individual point source outside, but within 25 miles of, the MSA/CMSA that emits at least 100 tpy VOC. For sources of VOC that emit from 10 to 25 tpy, emissions estimates may be determined by a survey of a

representative statistical sample (e.g., 10 percent) of sources within each source category in the MSA/CMSA and extrapolation of the collected data to the remaining sources. Detailed process and emissions data shall be reported for all sources that emit at least 25 tpy VOC. Previous inventories required VOC emissions data for each point source emitting at least 100 tpy.

° A listing of plant names and emission estimates shall be compiled and reported for each individual point source within the MSA/CMSA that emits at least 100 tpy of NO_x or CO and for each source outside, but within 25 miles of, the MSA/CMSA that emits at least 100 tpy of NO_x or CO.

° For areas that anticipate NO_x emission reductions as part of their demonstration of attainment for O_3, a detailed listing of NO_x process and emissions data shall be reported for each individual point source that emits at least 100 tpy.

° States shall assess rules existing before December 31, 1987, and rules resulting from post-1987 SIP revisions, and shall apply a rule effectiveness factor to emissions covered by these rules to estimate actual reductions that will be achieved. This is because, in the past, reductions from many national and local control measures have not been fully realized.

1.0 OVERVIEW OF DOCUMENT

1.1 PURPOSE

This document describes emission inventory requirements for the preparation of post-1987 O_3 SIPs for those areas that are required to revise their plan for attainment of the NAAQS for O_3.

1.2 SUMMARY OF DOCUMENT CONTENTS

As noted above, this section presents the purpose of this report and also provides an overview of the contents of the document. It briefly outlines the key points and format of the material presented in the remaining sections of this report.

Section 2 of this document introduces the emission inventory and its role in the post-1987 O_3 SIP revisions. Some background on the O_3 SIP revisions is also provided.

Section 3 details the specific requirements of the emission inventory. Inventory requirements are discussed with regards to topics such as geographic area of inventory, pollutants, base year inventory, projected attainment year inventory, point sources, area sources, mobile sources, and quality assurance.

Section 4 summarizes the SIP reporting requirements portion of the RFP program. The RFP program primarily tracks whether emission reductions expected as a result of SIP regulations are being achieved. The information and format required for reporting under RFP are briefly described.

Section 5 provides a recommended format for submitting emission inventory data, Section 6 focuses on documentation requirements of the inventory, and Section 7 describes the schedule for submitting the inventories and documentation.

2.0 INTRODUCTION

Many areas did not attain the NAAQS for O_3 by December 31, 1987, and corresponding States are now required to revise their SIPs. Revised SIPs shall include updated emission estimates for the MSA or CMSA in which a nonattainment determination was made. Base year and projected attainment year emission inventories for VOC, NO_x and CO shall be included in the attainment demonstration of these SIP revisions.

The Clean Air Act (CAA) prescribes that current, comprehensive and accurate emissions data shall be submitted to EPA for each attainment demonstration area. This document prescribes EPA's policies regarding the emissions data base to be submitted to EPA for post-1987 O_3 SIP revisions or redesignation requests. The EPA views compliance with these emission inventory data base requirements as an important component of post-1987 O_3 SIP submittals.

3.0 EMISSION INVENTORY REQUIREMENTS

Revised SIPs shall include base year and projected year emission inventories representative of a typical weekday during the peak O_3 season (generally May through September). The inventories shall be presented in two formats: 1) a summary of emissions of reactive VOC, NO_x and CO from stationary (point and area) sources and mobile sources by source category on a county-wide (or equivalent) basis; and 2) a more detailed list of stationary point source emissions and process information by facility process.

Emission estimates shall be determined to the extent possible, using source specific information in conjunction with methodologies described in inventory guideline references. One such reference, Procedures For The Preparation Of Emission Inventories For Volatile Organic Compounds - Volume I,[1] is recommended for use in inventorying VOC, NO_x and CO emissions from stationary sources. Another reference, Procedures For Emission Inventory Preparation, Volumes I-V,[2] was developed as general guidance to those engaged in inventorying criteria pollutants. Volume IV of this series contains information for inventorying VOC, NO_x and CO from mobile sources.

More specifically, States shall be guided by the requirements described below.

3.1 GEOGRAPHIC AREA TO BE INVENTORIED

The planning, or demonstration, area is generally the MSA, or CMSA, if one exists, in which nonattainment of the O_3 NAAQS was determined. MSAs and CMSAs in the United States are identified in Reference 3. Previous SIP inventories were required only for the counties in which the nonattainment determinations were made. The demonstration area has been expanded to all counties within the MSA/CMSA, because emissions from stationary sources and transportation systems (and associated vehicles) throughout the MSA/CMSA may contribute to the O_3 nonattainment problem. There are several instances in which an area larger than the MSA/CMSA should be used for the inventory. If monitoring sites that record exceedances of the O_3 NAAQS are located in counties adjacent to, but not within, an MSA/CMSA, sources within such counties should be included in the inventory. In cases where a previous Part D SIP has used a planning area larger than the MSA or CMSA, the area comprising the MSA/CMSA and the previous planning area should be used. In most cases under Part D, the Section 107 designated nonattainment areas coincide with the planning areas. However, some Section 107 areas in the northeast were larger, encompassing as much as the entire state. In such cases, the larger of the previous planning area or the MSA (not

the Section 107 area) should be used for the inventory. In cases where the present nonattainment area previously was classified as rural and thus, has no "previous planning area," the largest of the Section 107 area, the MSA, or the county in which the MSA is located should be used for the inventory. For isolated rural nonattainment areas (those not adjacent to a MSA/CMSA), the inventory area shall be the county in which the violation was determined.

In addition, major stationary sources that emit VOC, NO_x or CO at a level of at least 250 kg/day or 100 tons per year (tpy) located outside, but within 25 miles of, the MSA/CMSA boundary shall be included in the inventory. This is because these sources may contribute to exceedances of the NAAQS within the MSA/CMSA. Major emission sources within 25 miles of non-MSA/CMSA demonstration areas, such as those discussed above, shall be included in the inventory. In some cases, a major source may be located in one SIP call area and within 25 miles of another area receiving a SIP call. To avoid double counting, the source should be included only in the emission inventory of the MSA/CMSA in which it is located.

Emission inventory summaries (as described in Section 5) shall be reported for each county within the MSA/CMSA, except in those areas where information is commonly available at the parish, city, or township (e.g., the Northeast). In such cases, emission summaries may be compiled and maintained on this non-county basis.

3.2 POLLUTANTS TO BE INVENTORIED

The inventory shall contain a summary of emission estimates of VOC, NO_x and CO from point, area and mobile sources. Inventories of CO were not required in previous O_3 SIPs. However, recent evidence from smog chamber studies indicates that CO plays a small, but significant role in ozone production. Reductions in CO, due to automotive and other emission control programs, will reduce O_3 levels and the required amount of VOC control necessary to attain the NAAQS.

The emission inventory shall also contain a more detailed listing of VOC emissions data for point sources. For areas where NO_x reductions are anticipated to supplement VOC strategy in demonstrating attainment, the inventory shall also contain a detailed listing of NO_x emissions data for point sources. Emission inventories for VOC should be consistent with the Agency's reactivity policy discussed in the Federal Register.[4,5]

Nonreactive VOC compounds should be excluded from the inventory for purposes of O_3 SIPs, since controls on emissions of nonreactive compounds will neither contribute to the attainment

and maintenance of the NAAQS for O_3, nor be credited toward achievement of that standard. These compounds include:

methane
ethane
methylene chloride
methyl chloroform
trichlorotrifluoroethane (CFC-113)
trichlorofluoromethane (CFC-11)
dichlorodifluoromethane (CFC-12)
chlorodifluoromethane (CFC-22)
trifluoromethane (FC-23)
dichlorotetrafluoroethane (CFC-114)
chloropentafluoroethane (CFC-115)

Perchloroethylene has been proposed as a nonreactive VOC. However, until a decision on the status is complete, perchloroethylene should not be considered nonreactive and should be included in the inventory.

States are encouraged to use source specific test or mass balance data to estimate the magnitude of emissions for each major source. Emission factors should be used where source specific data are not available. Emission factors for VOC, NO_x and CO are contained within Compilation Of Air Pollutant Emission Factors, AP-42.[6,7] Emission factors for some source categories have not yet been published in AP-42 but are available elsewhere. For example, under the National Acid Precipitation Assessment Program (NAPAP), EPA developed VOC and NO_x emission factors for approximately 1000 source classification categories (SCCs) where factors were previously absent.[8] New VOC emission estimation procedures are available for hazardous waste Treatment, Storage and Disposal Facilities (TSDF), industrial waste water treatment facilities, Publicly Owned (waste water) Treatment Works (POTW), and municipal landfills.[1]

3.3 RULE EFFECTIVENESS (RE) AND PENETRATION

Past inventories have assumed that regulatory programs would be implemented with full effectiveness, achieving all of the required or intended emission reductions and maintaining that level over time. However, experience has shown regulatory programs to be less than 100 percent effective in most source categories in most areas of the country. The concept of applying RE in the SIP emission inventory has evolved from this observation. In short, RE reflects the ability of a regulatory program to achieve all the emission reductions that could be achieved by full compliance with the applicable regulations at all sources at all times.

Several factors should be taken into account when estimating the effectiveness of a regulatory program. These include (1) the nature of the regulation (e.g., whether any ambiguities or deficiencies exist, whether test methods and/or recordkeeping requirements are prescribed); (2) the nature of the compliance procedures (e.g., taking into account the long-term performance capabilities of the control): (3) the performance of the source in maintaining compliance over time (e.g., training programs, maintenance schedule, recordkeeping practices); and (4) the performance of the implementing agency in assuring compliance (e.g., training programs, inspection schedules, follow-up procedures).

In the proposed post-1987 ozone/CO policy, it was stated that a factor of 80 percent should be used to estimate RE in the base year inventories. The final policy will allow use of the 80 percent default value, but will also give States the option to derive local category-specific RE factors within some tightly prescribed guidelines as EPA deems appropriate. Whichever option is exercised to estimate RE, the results of a local source-by-source evaluation performed for a particular source category according to the protocol published by the Stationary Source Compliance Division will override estimated factors.

In the SIP inventory, the RE determined for the source category shall be applied to all sources in the category (both point and area sources) with the following exceptions: (1) sources not subject to the regulation, (2) sources achieving compliance by means of an irreversible process change that completely eliminates solvent use, and (3) sources for which emissions are directly determined by calculating solvent use over some time period and assuming all solvent was emitted from the source during that time period.

The RE factor shall be applied to the estimated control efficiency in the calculation of emissions from a source. An example of the application is given below.

Uncontrolled emissions = 50 lbs/day

Estimated control efficiency = 90%

Rule effectiveness = 80%

Emissions after control = 50 [1 - (0.90)(0.80)]

= 50 [1 - (0.72)]

= 14 lbs/day

Thus, the application of RE results in a total emission reduction of 72 percent.

In addition to RE, another important regulatory consideration is the extent to which a regulation may cover emissions from an area source category. When estimating emissions using area source methodologies for source categories where a rule or regulation applies, agencies shall incorporate an estimate of the amount of rule penetration by means of the following formula:

$$\text{Rule Penetration} = \frac{\text{Uncontrolled emissions covered by the regulation}}{\text{Total uncontrolled emissions}} \times 100 \text{ percent}$$

Once uncontrolled emissions and rule penetration are determined, RE should be applied as discussed above. An example of how to incorporate both penetration and RE in the same source category follows.

Uncontrolled emissions = 100,000 tpy

Control efficiency required by the regulation = 95 percent

Rule penetration = 60 percent

Rule effectiveness = 80 percent

Emissions from the category =

$$(100{,}000)[1 - (0.60)(0.95)(0.80)] = 54{,}400 \text{ tpy}$$

Further discussions of the use of rule effectiveness and rule penetration are included in Reference 1.

3.4 BASE YEAR EMISSION INVENTORY

The following discussion concerns the requirements for base year emission inventories to be used in conjunction with the EKMA model. Use of the EKMA model meets the minimum O_3 modeling requirements for development of a post-1987 O_3 SIP.

The base year inventory shall be representative of actual emission levels for the period of air quality data used in the modeling. Baseline inventories shall be prepared for a 1987 or 1988 base year. Base year emissions must reflect actual conditions, defined as the estimated typical emission rate multiplied times the average hourly production or throughput rate times hours of operation per day. The inventory shall take into account the impact of already implemented SIP regulations in base year emission levels. Base year inventories must also reflect appropriate effectiveness levels, as described above.

Base year VOC, NO_x and CO emissions should be calculated using assumptions that reflect conditions that exist on a typical weekday during the months that encompass the peak O_3 season (generally May through September). This is accomplished in two ways.

First, for source categories whose operating rates vary seasonally, typical weekday emissions should be determined using average O_3 season operating data obtained from the source. For some point sources, production (throughput) may increase or decrease during the peak O_3 period. Highway vehicle traffic, gasoline handling and space heating are examples of source categories whose activities generally vary from season to season (gasoline throughput typically increases during summer months).

Secondly, certain emission factors for some source categories vary as a function of temperature and/or humidity. Most importantly, the emission factors for gasoline-powered vehicles and petroleum product storage and handling operations are a function of temperature. NO_x emissions from light-duty vehicles are a function of absolute humidity. In compiling the emission inventory for post-1987 O_3 SIPs, temperature and humidity assumptions shall be consistent throughout the inventory, to the extent possible. The average temperature and humidity during the 10 highest ozone days during the design value period (normally three years) shall be used in estimating emissions from mobile and stationary sources, where applicable.

Generally, highway vehicle travel estimates are determined for an average annual weekday by the responsible Metropolitan Planning Organization (MPO) or State Department of Transportation. To develop an inventory of emissions for a typical O_3 season weekday, travel estimates for the O_3 season can be used if available, or a seasonal factor can be applied to average annual estimates to adjust for increases (or decreases, in some cases) in travel occurring during the O_3 season. Generally, such an adjustment factor can be derived from local traffic counting programs. Guidance for preparation of mobile source emission inventories is contained in Reference 9.

Emission estimates for point and area sources are frequently maintained on an annual basis in State and local inventories. For area sources, if seasonal activity levels are not available, the inventorying agency will have to apply seasonal and weekday adjustments to annual area source activity levels, based on local knowledge of the operating patterns of each source. If local operating data are unavailable to make such adjustments, the data presented in Reference 1 may be used for this purpose. Because local practices may vary, the use of local data, when available, is strongly encouraged.

The requirements described above concern preparation of base year emission inventories to be used in conjunction with the EKMA model. Use of the EKMA model meets the minimum O_3 modeling requirements for development of a post-1987 O_3 SIP. However, use of the Urban Airshed model, while not required, is encouraged. If the Urban Airshed model is to be used by the agency compiling the base year emissions inventory, an hourly gridded emissions inventory would be necessary.[10]

3.5 PROJECTED ATTAINMENT YEAR EMISSION INVENTORY

An inventory of estimated VOC, NO_x and CO emissions shall be developed for the year the O_3 standard is projected to be attained. If attainment is projected to occur more than 3 years from the base year, emissions must be projected for each 3-year period prior to attainment. The first interim projection must be for 5 years (rather than 3 years) after the base year. Interim emission reduction projections would then be made for each 3-year period starting from the initial 5-year projection and extending to the attainment date. Two types of emission estimates are required for the projection inventories and are described below: (a) projected baseline emissions, and (b) projected "new or revised SIP strategy" emissions.

(a) The projected baseline emission estimates shall be based on allowable emissions and shall reflect the increases or decreases in emissions due to growth since the base year and enforceable emission rates resulting from regulations with compliance deadlines of December 31, 1987, or before (i.e., previous SIPs). Projected baseline emissions should not reflect reductions resulting from additional regulations required for attainment in post-1987 O_3 SIPs.

The projected baseline inventory should reflect changes in emissions due to unique, irregularly occurring events or conditions which affected the base year inventory. For example, the projected inventory should not reflect temporary reductions in emissions that occurred in the base year resulting from strikes, recession-influenced production cutbacks or other unusual factors (such as major equipment malfunctions or variances).

(b) The projected, "new or revised SIP strategy" emission estimates shall account for the changes included in the baseline projection and the impact of additional stationary source regulatory controls to be adopted as part of the post-1987 O_3 SIPs. The "revised SIP strategy" emission estimates shall be based on allowable emissions, which are the product of an enforceable emission rate (e.g., pounds of VOC per gallon of solids applied), the operating capacity (e.g., gallons of solids applied per hour), and the actual operating schedule (hours per

day) for a typical or average peak O_3 season weekday in the projected year. Projected emissions must then be adjusted for effectiveness of regulatory controls for applicable sources (see Section 3.3). The projected interim and attainment year inventories should be developed with procedures for projecting emissions contained within References 1 and 2.

3.6 POINT SOURCES

At a minimum, stationary sources (facilities) that emit equal to or greater than 10 tons per year VOC, on an actuals basis, shall be considered as point sources. Previous SIP inventories defined the cutoff for VOC point sources as sources with the "potential to emit" 100 tons per year. Stationary sources that emit equal to or greater than 100 tons per year NO_x or CO, on an actuals basis, shall also be considered point sources. Point source emission cutoff levels less than 10 tons per year for VOC, and less than 100 tons per year for NO_x and CO, are encouraged, especially for sources for which States will be defining Reasonably Available Control Technology (RACT), and/or other control regulations.

Detailed process and emissions data shall be collected and reported for each VOC point source that emits equal to or greater than 25 tons per year, at a minimum, as discussed in Section 5. States are encouraged to collect such data for VOC sources that emit equal to or greater than 10 tpy. A summary listing of plant names, locations and total plant emissions (tons/day) is required for sources of NO_x and CO that emit at least 100 tons per year. Detailed process and emissions data for each NO_x point source that emits equal to or greater than 100 tons per year is required for areas that anticipate NO_x reductions as part of their O_3 control strategy.

For VOC point sources expected to emit between 10 and 25 tpy, a survey of a statistical sample of sources in each source category can be used to estimate emissions in the MSA/CMSA. For each source category inventoried using this method, the sample survey must identify the location, activity (e.g., production, throughput, or number of employees), and emissions for a statistical sample (e.g., 10 percent) of the 10 to 25 tpy sources in the attainment demonstration area. The location and activity level of the remaining 10 to 25 tpy sources can be identified using information from business survey statistics, trade associations, Chambers of Commerce, etc. Emissions for each source shall then be estimated by extrapolating the data collected in the sample survey (e.g., emissions-per-production, per-throughput or per-employee) to the remaining sources. These statistical estimates for the 10 to 25 tpy sources can not be used as a baseline for new source review or emissions trading policies. This method is described further in Reference 1.

3.7 AREA SOURCES

Area sources include those emissions from stationary and non-highway sources that are too small and/or too numerous to be included in the point source inventory, but which can contribute collectively to O_3 formation. As such, it is possible for area source emissions to be reported for many of the same source categories as point sources. All service stations and commercial dry cleaners may be considered as area sources in the VOC inventory because the bulk of these facilities emit less than 10 tons per year.

In a number of previous SIP submittals, emissions from many small sources have been inadvertently left out of inventories because of a lack of available procedures or lack of emphasis on this portion of the inventory. Existing methodologies can be used to estimate emissions from the various area source categories. Detailed procedures are discussed in Reference 1. However, some of these techniques are briefly described herein for emphasis.

Large sources are inventoried by use of questionnaires, plant visits, permit data, etc. In many instances, emissions information for smaller sources (i.e., less than 10 tons per year of VOC, and less than 100 tons per year of NO_x or CO) is developed via the same methods, since there may be no other alternatives available to accurately inventory sources in some source categories. For this reason, use of point source methods is recommended, even for determining emissions for source categories below the cutoff levels mentioned above. In such cases, States are encouraged to maintain and report individual point source records for each of the smaller source emissions.

Emissions from certain area source categories, especially those associated with solvent use, may be estimated on a per capita basis. This procedure may be necessary when the availability of other area source estimating methodologies is limited. Population estimates used in making such emission estimates should be documented. Specific information on per capita factors to be used is contained in Reference 1.

Another area source procedure essentially uses nationally derived emissions-per-employee factors to calculate emissions from sources in an area based on areawide employment data. The procedure is best utilized for those source categories where (a) total employment in the source category is known for the area, and (b) where there are numerous sources whose emissions are typically less than the cutoffs mentioned above for point sources, but whose collective emissions represent a significant total.

3.8 MOBILE SOURCES

The mobile source emission inventory must include a detailed account of highway vehicle emissions in the demonstration area (MSA/CMSA). Emissions from local traffic, as well as emissions from traffic on major highways, must be included. Particular care should be taken to obtain accurate information of vehicle miles traveled (VMT) and vehicle speed.[9] As described below, fuel volatility must also be accurately described for proper calculation of highway vehicle emission estimates. MOBILE4 shall be used in all non-California areas for estimating emissions from mobile sources.[11]

3.9 FUEL VOLATILITY

Gasoline marketing, storage, transportation, and usage account for a significant portion of the VOC inventory. The amount of VOC that is evaporated from fuel sources depends upon the volatility of the fuel, which is characterized by its Reid Vapor Pressure (RVP). The inventory should account for vapor pressure variations by area of the country and time of year.

Fuel volatility, in terms of RVP, is one of several inputs required for estimating motor vehicle emissions with MOBILE4. Specific guidance on determining local RVP, as well as other inputs to MOBILE4 for the inventory area is provided in the User's Guide to MOBILE4.[9] The RVP used in the base year inventory shall be used in all projected inventories, unless national volatility control is regulated or local volatility control is a strategy option.

3.10 QUALITY ASSURANCE (QA)

A QA program shall be implemented to enhance the overall quality of the emission inventory. One of the key elements of this program shall be the development of a quality assurance plan by the agency preparing the inventory. This plan shall include a discussion of the steps that will be taken by the agency to ensure the quality and reliability of the inventory, as described in Reference 13. For example, efforts should be undertaken to ensure that all VOC, NO_x and CO point sources are included in the inventory. Comparisons of source listings with independent listings prepared by others (e.g., trade associations, etc.) or with listings derived by the States, based on guidance contained in References 1 and 2, is recommended. In some areas, extensive inventory efforts have been undertaken, such as those in the NAPAP, and should be cross-referenced with SIP emission inventories, and/or compared with State and locally maintained data bases from earlier years. Where discrepancies exist between inventories for an area, resolution of the discrepancies should be documented for current SIP base year emission inventories.

Quality checks should be designed into the SIP emission inventory program and be documented in the inventory submittal. Quality checks should include some sampling of calculated data to be recalculated by independent methods (i.e., different data systems or personnel). It is advisable that checks also include some comparisons of process data and emissions with expected ranges to ensure they are reasonable and consistent. Further discussions of quality checks are contained in References 1, 2 and 12.

The emission inventory should be reviewed by the agency preparing the inventory for completeness and satisfaction of EPA requirements prior to submittal. The EPA will use the checklist in Appendix B for an initial review of the SIP emission inventories. State and local agencies should also use this checklist for a "pre-submittal" completeness review. A complete base year emissions inventory shall be submitted by mid-November 1989, approximately one (1) year from the completion of the Workshops For Development Of O_3/CO SIP Emission Inventory, to allow EPA to review both the inventory and the quality assurance plan and to identify needed improvements and/or adjustments. [Refer to Section 7 for more information on the schedule for submitting the inventory.]

The final SIP emission inventory package, to be submitted with the SIP approximately two (2) years after EPA issues the post-1987 O_3/CO Policy, shall include the final base year and projected inventories along with supporting documentation. This package also should be reviewed for completeness and satisfaction of requirements (before submittal).

4.0 REASONABLE FURTHER PROGRESS REPORTING REQUIREMENTS

To track and verify whether emission reductions that are expected to occur as a result of SIP regulations are being achieved, States shall submit information as required in the RFP program.[13] The three (3) principal requirements of the RFP program are: 1) the initial listing in the SIP of sources to be tracked, along with their projected emissions; 2) an annual RFP status report and updating for permanent changes in emissions for a subset of key emission sources and source categories within nonattainment areas, based on criteria described in Reference 13; and 3) a periodic (3-year) update of the entire inventory.

As part of the initial RFP reporting requirements, the States shall include in the SIP a section that:

(a) Identifies the total VOC emission reduction expected to occur for all sources as a result of compliance with SIP regulations.

(b) Lists a subset of point sources (based on criteria described in Reference 13) to be tracked, the area and mobile source categories affected by SIP regulations, base year actual emissions, SIP regulation(s) affecting each source/source category, year of expected compliance with specific regulation(s), and projected allowable emissions when source/source category comes into compliance.

Projected allowable emissions are calculated estimates for planning purposes that result from the applications of enforceable SIP emission limits (e.g., lb/gal), assumptions of further production, and adjustments for control effectiveness. Therefore, these should not be interpreted as enforceable emission limits. However, significant exceedances above these projections in the aggregate may indicate need for corrective action.

(c) Tabulates the information described in (b) above to illustrate the annual reductions expected to occur as a result of compliance by source/source category from base year to expected attainment year (includes increases in emissions due to anticipated growth).

(d) Presents, in a graphical fashion, the anticipated total emission reduction or total emissions for the subset of sources/source categories to be tracked on a year-to year basis from base year to year of expected attainment. (The emission reduction or total emissions target for the year of attainment shall be based on projected allowable emissions).

Following the initial listing of RFP information in the SIP, tracking of RFP must continue through annual reports and periodic

(3-year) updates of the emission inventory. Specific requirements for RFP tracking are contained in Reference 13.

5.0 FORMAT FOR SUBMISSION OF INVENTORY DATA

The SIP emission inventory shall be reported as follows:

5.1 SUMMARY FORMAT

(a) In order to facilitate strategy evaluation, area-to-area consistency, the demonstration area emission inventory should be summarized on a countywide (or equivalent) basis, in the reporting format illustrated in Table 1. Other summary formats equivalent to those shown in Table 1 are acceptable, if approved by the EPA Regional Office, and if the alternative formats contain emission estimates in terms of average daily emissions for the ozone season by source category. Emissions should be summarized for source categories that relate to the various RACT control measures, such as those source categories listed in Table 1.

The inventory shall include individual tables summarizing seasonally adjusted emissions of VOC, NO_x and CO for each county (or equivalent). Each summary table submitted with the base year inventory shall include emissions from stationary point sources, stationary area sources and mobile sources, summarized by source category or vehicle type. Projected emissions summaries shall be submitted with the final SIP emissions inventory.

5.2 INDIVIDUAL POINT SOURCE LISTING

In order to facilitate strategy evaluation, emissions for each VOC source inventoried as a point source (i.e., generally those that emit at least 10 TPY) shall be reported in a format similar to that illustrated in Table 2. However, if the alternative method described in Section 3.6 is used to inventory VOC point sources that emit between 10 and 25 tpy, then the data requirements are limited to a listing of each plant name, location, activity (rate of production or throughput, or number of employees) emissions estimate, emission factor, and source category. For sources of NO_x and CO that emit at least 100 tpy, a listing of plant names, locations and total plant emissions (tons per day) is required. If point source NO_x emission reductions are used to demonstrate attainment for O_3, Table 2 must also be submitted for NO_x point sources that emit at least 100 tpy. Alternative (including computer produced) formats containing equivalent information are acceptable, if agreed to by the EPA Regional Office. Actual emis-sions shall be included for the base year and <u>allowable</u> emissions projected for the attainment year. Appendix A identifies major point source categories and principal procedures/operations within the categories that should be reported in Table 2.

TABLE 1-A

Summary Table Of VOC Emissions (Tons Per Day)[1] For _____
(County or Equivalent)

	Applicable Regulation[2]	Base Year (specify year)		Base Line Projection[3] (specify year)		Revised SIP Strategy Projection[3] (specify year)	
		Point	Area	Point	Area	Point	Area
Storage, Transportation And Marketing Of VOC							
Oil and Gas Production							
Natural Gas and Gasoline Processing							
Other Petroleum Processing							
Gasoline and Crude Oil Storage[4]							
All (except floating roof)							
Floating Roof							
Volatile Organic Liquid Storage							
VOL - Transfer							
Ship and Barge							
Other							
Barge and Tanker Cleaning							
Bulk Gasoline Terminals[5]							
Gasoline Bulk Plants[6]							
Service Station Loading (Stage I)							
Service Station Unloading (Stage II)							
Gasoline Tank Trucks							
Others (specify)							
Industrial Processes							
Petroleum Refineries							
Vacuum Systems							
Fugitive							
Other							
Lube Oil Manufacture							

[1] Typical peak ozone season weekday.
[2] List appreviations at end of table with brief explanation, (i.e., I-XX.X = Group I CTG, State Reg XX.X; II-YY.Y = Group II CTG, State Reg. YY.Y; etc.).
[3] Required with final SIP submittal. Some areas may require projections for multiple years.
[4] Includes all storage facilities except those at service stations and bulk plants.
[5] Emissions from loading tank trucks and rail cars.
[6] Emissions from storage and transfer operations.

TABLE 1-A

Summary Table Of VOC Emissions (Tons Per Day)[1] For _____
(County or Equivalent)

	Applicable Regulation[2]	Base Year (specify year)		Base Line Projection[3] (specify year)		Revised SIP Strategy Projection[3] (specify year)	
		Point	Area	Point	Area	Point	Area
Organic Chemical Manufacture							
Polyethylene							
Propylene							
Polystyrene							
Others (specify)							
SOCMI							
Fugitive							
Air Oxidation							
Others (specify)							
Inorganic Chemical Manufacture							
Fermentation Processes							
Vegetable Oil Processing							
Pharmaceutical Manufacture							
Plastic Products Manufacture							
Rubber Tire Manufacture							
SBR Rubber Manufacture							
Textile Polymers and Resin Manufacture							
Synthetic Fiber Manufacture							
Iron and Steel Manufacture							
Coke Ovens							
Others (specify)							
Industrial Surface Coating							
Large Appliances							
Magnet Wire							
Autos and Light Trucks							
Cans							
Metal Coils							
Paper							
Fabric							
Metal and Wood Furniture							
Miscellaneous Metal Products							
Flatwood Products							
Plastic Products							

(continued on next page)

[1] Typical peak ozone season weekday.

[2] List appreviations at end of table with brief explanation, (i.e., I-XX.X = Group I CTG, State Reg XX.X; II-YY.Y = Group II CTG, State Reg. YY.Y; etc.).

[3] Required with final SIP submittal. Some areas may require projections for multiple years.

TABLE 1-A

Summary Table Of VOC Emissions (Tons Per Day)[1] For _____
(County or Equivalent)

	Applicable Regulation[2]	Base Year (specify year)		Base Line Projection[3] (specify year)		Revised SIP Strategy Projection[3] (specify year)	
		Point	Area	Point	Area	Point	Area
Large Ships							
Large Aircraft							
Others (specify)							
Non-industrial Surface Coating							
Architectural Coatings							
Auto Refinishing							
Others (specify)							
Other Solvent Use							
Degreasing							
Dry Cleaning							
Perchloroethylene							
Petroleum							
Other							
Graphic Arts							
Adhesives							
Cutback Asphalt							
Solvent Extraction Processes							
Consumer/Commercial Solvent Use							
Others (specify)							
Waste Disposal							
Municipal Waste							
Combustion							
Landfills							
TSDFs							
POTWs							
ITWs							
Industrial Boiler Co-firing							
Others (specify)							

[1] Typical peak ozone season weekday.

[2] List appreviations at end of table with brief explanation, (i.e., I-XX.X = Group I CTG, State Reg XX.X; II-YY.Y = Group II CTG, State Reg. YY.Y; etc.).

[3] Required with final SIP submittal. Some areas may require projections for multiple years.

TABLE 1-A

Summary Table Of VOC Emissions (Tons Per Day)[1] For _____
(County or Equivalent)

	Applicable Regulation[2]	Base Year (specify year)		Base Line Projection[3] (specify year)		Revised SIP Strategy Projection[3] (specify year)	
		Point	Area	Point	Area	Point	Area
Other Miscellaneous Sources							
Fuel Combustion							
Forest, Agricultural, and Other Open Burning							
Pesticide Applications							
Stationary Internal Combustion Engines							
Mobile Sources							
Highway Vehicles							
Light Duty Gasoline Vehicles (LDGV)							
Light Duty Diesel Vehicles (LDDV)							
Light Duty Gasoline Trucks							
Type 1 (<6000 lbs) (LDGT1)							
Type 2 (6000-8500 lbs) (LDGT2)							
Light Duty Diesel Powered Trucks (LDDT)							
Heavy Duty Gasoline Trucks (HDGV)							
Heavy Duty Diesel Trucks (HDDV)							
Motorcycles (MC)							
Non-highway Vehicles							
Rail							
Aircraft							
Vessels							
Other							
Mobile Sources Total:							
Stationary Sources Total:							
Grand Total For All Sources:							

[1] Typical peak ozone season weekday.

[2] List appreviations at end of table with brief explanation, (i.e., I-XX.X = Group I CTG, State Reg XX.X; II-YY.Y = Group II CTG, State Reg. YY.Y; etc.).

[3] Required with final SIP submittal. Some areas may require projections for multiple years.

TABLE 1-B

Summary Table Of NO_x Emissions (Tons Per Day)[1] For _____
(County or Equivalent)

	Base Year (specify year)		Base Line Projection[2] (specify year)		Revised SIP Strategy Projection[2] (specify year)	
	Point	Area	Point	Area	Point	Area
External Fuel Combustion						
Utility Boilers						
Industrial Boilers						
Commercial, Institutional, Residential						
Other External Fuel Combustion						
Stationary Internal Combustion						
Reciprocating Engines						
Gas Turbines						
Other Combustion						
Waste Disposal						
Open Burning						
Other						
Industrial Processes						
Chemical Manufacturing						
Adipic Acid						
Nitric Acid						
Other						
Iron and Steel						
Mineral Products						
Cement						
Glass						
Other						
Petroleum Refining						
Other						
Mobile Sources						
Highway Vehicles						
Light Duty Gasoline Vehicles (LDGV)						
Light Duty Diesel Vehicles (LDDV)						
Light Duty Gasoline Trucks						
Type 1 (<6000 lbs) (LDGT1)						
Type 2 (6000-8500 lbs) (LDGT2)						
Light Duty Diesel Powered Trucks (LDDT)						
Heavy Duty Gasoline Trucks (HDGV)						
Heavy Duty Diesel Trucks (HDDV)						
Motorcycles (MC)						

[1] Typical peak ozone season weekday.
[2] Required with final SIP submittal. Some areas may require projections for multiple years.

TABLE 1-B

Summary Table Of NO_x Emissions (Tons Per Day)[1] For _____
(County or Equivalent)

	Base Year (specify year)		Base Line Projection[2] (specify year)		Revised SIP Strategy Projection[2] (specify year)	
	Point	Area	Point	Area	Point	Area
Non-highway Vehicles						
Rail						
Aircraft						
Vessels						
Other						
Mobile Sources Total:						
Stationary Sources:						
>250m Effective Stack Height: Subtotal						
Other Stationary Sources: Subtotal						
Grand Total For All Sources:						

[1] Typical peak ozone season weekday.
[2] Required with final SIP submittal. Some areas may require projections for multiple years.

TABLE 1-C

Summary Table Of CO Emissions (Tons Per Day)[1] For _____
(County or Equivalent)

	Base Year		Base Line Projection[2] (specify year)		Revised SIP Strategy Projection[2] (specify year)	
	Point	Area	Point	Area	Point	Area
External Fuel Combustion						
Utility Boilers						
Industrial Boilers						
Commercial, Institutional, Residential						
Other External Fuel Combustion						
Stationary Internal Combustion						
Reciprocating Engines						
Gas Turbines						
Other Combust...l						
Waste Disposal						
Other						
Industrial Processes						
Chemical Manufacturing						
Iron and Steel						
Mineral Products						
Petroleum Refining						
Other						
Mobile Sources						
Highway Vehicles						
Light Duty Gasoline Vehicles (LDGV)						
Light Duty Diesel Vehicles (LDDV)						
Light Duty Gasoline Trucks						
Type 1 (<6000 lbs) (LDGT1)						
Type 2 (6000-8500 lbs) (LDGT2)						
Light Duty Diesel Powered Trucks (LDDT)						
Heavy Duty Gasoline Trucks (HDGV)						
Heavy Duty Diesel Trucks (HDDV)						
Motorcycles (MC)						
Non-highway Vehicles						
Rail						
Aircraft						
Vessels						
Other						

[1] Typical peak ozone season weekday.

[2] Required with final SIP submittal. Some areas may require projections for multiple years.

TABLE 1-C

Summary Table Of CO Emissions (Tons Per Day)[1] For _____
(County or Equivalent)

	Base Year		Base Line Projection[2] (specify year)		Revised SIP Strategy Projection[2] (specify year)	
	Point	Area	Point	Area	Point	Area
Mobile Sources Total:						
Stationary Sources:						
Grand Total For All Sources:						

[1] Typical peak ozone season weekday.
[2] Required with final SIP submittal. Some areas may require projections for multiple years.

Table 2. Emissions Information for Individual Processes Within a Point Source Facility[1]

Plant Information

Pollutant (VOC, NOx): _____

Plant Name: _____

Base Year (1987 or 1988): _____

NEDS ID (State, County, Plant): -- ---- ----

Street Address, City, State: _____

Projected Attainment Year: _____

Model Area (County, Township, or Grid Code): _____

SIC Code(s):[2] _____

Total Banked Emissions (tons/yr): _____

Base Year Point Information

NEDS Point ID	Process Description	Operating Schedule[3] (hr/dy)	(dy/wk)	(wk/yr)	Applicable Regulation	Emission Limitation	Compliance Year	CTG Category (I,II,III)

Base Year Segment Information

NEDS Point ID	SCC[4]	Process Rate Units[5]	Process Rate (/day)[6]	Control Equipment[7]	Control Efficiency (%)	Emission Estimation Method[8]	Emission Factor (lb/process rate unit)	Rule Effectiveness (%)	O_3 Season Emissions (lbs/day)	Banked Emissions (tons/yr)
	- - - -									
	- - - -									
	- - - -									
	- - - -									
	- - - -									
	- - - -									
	- - - -									
	- - - -									
	- - - -									

Table 2. Emissions Information for Individual Processes Within a Point Source Facility (cont.)[1]

Projection Year Information

Projection Year ____

Point ID	SCC	Control Equipment	Efficiency (%)	Growth Factor	Projected Baseline Emissions[10] (lbs/day)	Applic. Regulation	Emission Limitation	Compliance Year	Rule Effectiveness (%)	Projected SIP Strategy Emissions[11] (lbs/day)
____	-_-_-_-	_____	_____	____	_____	_____	_____	_____	_____	_____
____	-_-_-_-	_____	_____	____	_____	_____	_____	_____	_____	_____
____	-_-_-_-	_____	_____	____	_____	_____	_____	_____	_____	_____
____	-_-_-_-	_____	_____	____	_____	_____	_____	_____	_____	_____
____	-_-_-_-	_____	_____	____	_____	_____	_____	_____	_____	_____
____	-_-_-_-	_____	_____	____	_____	_____	_____	_____	_____	_____
____	-_-_-_-	_____	_____	____	_____	_____	_____	_____	_____	_____
____	-_-_-_-	_____	_____	____	_____	_____	_____	_____	_____	_____

Notes:

1. The format presented in this table is recommended for inventorying point sources that emit VOC. This format is also recommended for facilities emitting NOx in areas where NOx emission reductions are anticipated as part of the attainment strategy. Other formats with equivalent information may be substituted.

2. Standard Industrial Classification code(s) describing plant operations.

3. Indicate hours per day and days per week for typical ozone season operating schedule.

4. Source Classification Code (SCC). See Reference 8.

5. Operating rate units (eg., thousand gallons burned) associated with SCC or other emission factor.

6. Actual process or operating rate for typical ozone season weekday in units listed in previous column. This may be omitted for sources where emissions are <u>not</u> dependent on process rate.

7. Indicate appropriate control equipment code(s). See Reference 1, page 5-9 for listing of AEROS control equipment codes.

8. Method used to estimate emissions. 0 = not applicable; 1 = stack test; 2 = material balance; 3 = calculated using SCC emission factor; 4 = guess; 5 = calculated using non-SCC emission factor; 6 = new construction, not yet operational; 7 = facility closed, operations ceased.

9. Factor used to estimate increase in emissions due to growth since base year.

10. Based on allowable emissions and reflecting increases or decreases in emissions due to growth since the base year and enforceable emission rates resulting from regulations with compliance deadlines prior to 1/1/88. Should not reflect reductions resulting from post-87 SIP strategy.

11. Based on allowables emissions and reflecting changes in projected baseline emissions due to post-87 SIP strategy.

6.0 DOCUMENTATION OF THE INVENTORY

Inventory documentation shall include a narrative report describing the procedures, data and assumptions used in compiling the base year and projected attainment year inventories. Documentation of the base year inventory shall be submitted with the inventory (i.e., within twelve (12) months of receipt of the guidance). Similarly, documentation for the projected emissions shall accompany the projected inventory due with the SIP. [See Section 7 for a discussion of the schedule for submitting emission inventory information.]

Items to be included in the documentation are listed below:

A. The geographic areas included in the inventory.

B. The population of the area, as well as the source of the population data used in making emission estimates and projections.

C. Data, assumptions and procedures used in determining or projecting emissions. Techniques used to estimate area source emissions. Activity base (e.g., employment, gas usage) and projection levels should be documented. Use and basis of emission factors, other than those in AP-42, for stationary sources should be provided. Procedures and data used for exclusion of nonreactive VOC and for seasonally adjusting the inventory totals should likewise be documented.

D. Procedures and results of the emission inventory QA program, including data "reasonableness" ranges and QA objectives.

E. Information shall be reported that describes the basis for highway vehicle emissions estimates, as listed below. In cases where default parameters from MOBILE4 are used, this should be stated.

1. Description of procedures and models used to estimate base year and future year transportation parameters.

2. Description of the travel data base and any subsequent updates. When possible, estimates of the degree of accuracy and other statistical parameters should be included.

3. Description of traffic counting programs. Estimates of the degree of accuracy of VMT estimates based on traffic counts should be included.

4. Description of methods used to estimate vehicle speeds. Special speed studies should be documented.

5. Description of methods for estimating truck travel parameters (VMT, speed, etc.).

6. Description of methods for estimating traffic parameters (VMT, speed, etc.) for local (off-network) traffic.

7. Description of methods used to estimate VMT in the hot and cold start modes.

8. Description of method used to estimate trips per day and miles per trip in calculating evaporative emissions.

9. Description of how local fuel volatility (i.e., RVP) was determined.

10. Description of methods used to calculate emissions, including a description of how data were aggregated and emission factors applied.

11. Description of how other emission parameters (such as vehicle age distribution, average annual miles driven by model year) were obtained.

7.0 SCHEDULE FOR SUBMISSION OF INVENTORY ITEMS

7.1 INITIAL INVENTORY SUBMITTAL

1. A complete base year emissions inventory (e.g., 1987) for VOC, NO_x and CO, including data elements described in Sections 3 and 5 and documentation described in Section 6, shall be submitted to the EPA Regional Office no later than twelve (12) months after receipt of the emission inventory guidance. EPA will return comments on the initial inventory submittals, as agreed upon with the Regional Office, generally within three (3) months of receipt of the inventories. EPA will not provide "preapproval" of the inventory, but rather EPA's review is intended as part of the QA process to identify any deficiencies or needed improvements/adjustments before the final inventory is submitted. EPA's review of the inventory should not delay development of the SIP.

2. A quality assurance plan describing the steps taken by the agency preparing the inventory to assure the completeness and reliability of the emissions inventory.

7.2 FINAL INVENTORY SUBMITTAL

1. Final base year emission inventories including both detailed point source data and summarizes by source category and county (as discussed above), shall be submitted to the EPA Regional Office with the SIP. These inventories shall reflect EPA comments to the initial inventory submittals.

2. Projected baseline inventories and "new or revised SIP strategy" attainment year inventories of reactive VOC, NO_x and CO, summarized by source category (see Section 5, Table 1), shall be submitted to the EPA Regional Office with the SIP. The emissions summarized should represent totals for each county (or equivalent) within the designated nonattainment area.

3. For point sources that emit VOC equal to or greater than 10 tpy, a final listing of process information and VOC emission estimates for each source (see Section 5, Table 2) shall be submitted to the EPA Regional Office with the SIP. A final listing of plant names, locations and emission estimates shall be submitted for sources that emit NO_x or CO equal to or greater than 100 tpy. For areas where point source NO_x emission reductions are used to demonstrate attainment for O_3, a listing of process information and NO_x emission estimates (see Section 5, Table 2) for point sources within the nonattainment area that emit NO_x equal to or greater than 100 tpy shall be submitted with the SIP. This listing shall be for the base year and for the projected baseline and "revised SIP strategy" emission estimates.

4. A report that documents the procedures and assumptions in compiling all inventories discussed above shall be submitted to the EPA Regional Office with the SIP. [Refer to Section 6 for a discussion of documentation requirements.]

5. A subset of point sources to be tracked under RFP reporting requirements. Also, tabulation and graphical representation of emission reductions or total emissions expected for point source subset on a year-to-year basis from base year to expected attainment year.

8.0 REFERENCES

1. Procedures For The Preparation Of Emission Inventories For Precursors Of Ozone, Volume I, EPA-450/4-88-021, U. S. Environmental Protection Agency, Research Triangle Park, NC, December 1988.

2. Procedures For Emission Inventory Preparation, Volumes I-V, EPA-450/4-81-026, a-e, U. S. Environmental Protection Agency, Research Triangle Park, NC, September 1981.

3. Statistical Abstracts Of The United States, 1988, U. S. Department of Commerce, Appendix II.

4. Federal Register, Volume 42, No. 131, July 8, 1977, page 35314.

5. Federal Register, Volume 45, No. 142, July 22, 1980, page 48941.

6. Compilation Of Air Pollutant Emission Factors, Volume I - Stationary Point And Area Sources, Fourth Edition and subsequent Supplements, AP-42, U. S. Environmental Protection Agency, Research Triangle Park, NC, September 1985.

7. Compilation Of Air Pollutant Emission Factors, Volume II - Mobile Sources, Fourth Edition, AP-42, U. S. Environmental Protection Agency, Ann Arbor, MI, September 1985.

8. Criteria Pollutant Emission Factors For The 1985 NAPAP Inventory, EPA-600/7-87-015, U. S. Environmental Protection Agency, Research Triangle Park, NC, May 1987.

9. Procedures For Emission Inventory Preparation, Volume IV: Mobile Sources (Section 4, Emissions from Highway Vehicles, is being revised for distribution in February 1989), EPA-450/4-81-026d, U. S. Environmental Protection Agency, Research Triangle Park, NC, December 1988.

10. Procedures For The Preparation Of Emission Inventories For Volatile Organic Compounds, Volume II: Emission Inventory Requirements For Photochemical Air Quality Simulation Models, EPA-450/4-79-018, U. S. Environmental Protection Agency, Research Triangle Park, NC, September 1979.

11. User's Guide To MOBILE4 (Mobile Source Emissions Model - Currently Under Development, Available February 1989), U. S. Environmental Protection
Agency, Ann Arbor, MI.

12. Guidance For The Preparation Of Quality Assurance Plans For Ozone/Carbon Monoxide SIP Emission Inventories, EPA-450/4-88-023, U. S. Environmental Protection Agency, Research Triangle Park, NC, December 1988.

13. "Revised Guidance For Tracking Reasonable Further Progress (RFP) In Ozone Control Programs," Monitoring and Data Analysis Division, U. S. Environmental Protection Agency, Research Triangle Park, NC, September 1986.

APPENDIX A

Individual Point Source Summary

(Source Category List For Completing Table 2)

APPENDIX A

INDIVIDUAL POINT SOURCE SUMMARY

Storage, Transportation And Marketing Of Petroleum Products and Volatile Organic Liquids (VOL)

Oil And Gas Production
- Storage
- Fugitives
- Other Process Units (specify)

Natural Gas And Gasoline Processing
- Storage
- Fugitives
- Other Process Units (specify)

Oil Processing
- Storage
- Fugitives
- Other Process Units (specify)

Tank Farms (specify material stored)
- Fixed Roof Tanks
- External Floating Roof Tanks
  - Primary Seals
  - Secondary Seals
- Internal Floating Roof Tanks

Bulk Gasoline And VOL Terminals
- Leaks From Valves, Flanges Meters, Pumps
- Vapor Collection Losses
- Vapor Control Unit Losses
- Filling Losses From Uncontrolled Loading Racks
- Tank Truck Vapor Leaks From Loading Of Gasoline
- Non-tank Farm Storage

Gasoline Bulk Plants
- Gasoline Bulk Storage
- Loading And Unloading Racks (Controlled And Uncontrolled)
- Tank Truck Vapor Leaks From Loading And Unloading Of Gasoline
- Leaks From Valves, Flanges, Meters, Pumps

Barge And Tanker Transfer
- Gasoline Loading/Barge
- Crude Oil Ballasting/Tanker

Barge And Tanker Cleaning

Industrial Processes

Petroleum Refineries
- Process Drains And Wastewater Separators
- Vacuum Producing Systems
- Process Unit Turnarounds
- Fugitive Leaks From Seals, Valves, Flanges
  - Pressure Relief Devices, Drains
- Other Process Emissions Such As Heaters, Boilers
  - Cat Cracker Regenerators (specify)

Lube Oil Manufacture

Pharmaceutical Manufacture
- Process Units Such As Vacuum Dryers, Reactors,
  - Distillation Units, Filters, Extractors,
  - Centrifuges, Crystallizers
- Major Production Equipment Such As Exhaust Systems And
  - Air Dryers
- Storage And Transfer
- Other Process Units (specify)

Rubber Tire Manufacture
- Undertread And Sidewall Cementing
- Bead Dipping
- Bead Swabbing
- Tire Building
- Tread End Cementing
- Green Tire Spraying
- Tire Curing
- Solvent Mixing
- Solvent Storage
- Other Process Units (specify)

Styrene Butadiene Rubber Manufacture
- Blowdown Tanks
- Steam Stripper
- Prestorage Tanks
- Other Process Units (specify)

Vegetable Oil
- Oil Extraction And Desolventization
- Mean Preparation
- Oil Refining
- Fugitive Leaks
- Solvent Storage
- Other Process Units (specify)

Organic Chemical Manufacture (specify major chemicals)
- Fugitive Leaks From Seals, Valves, Flanges, Pressure Relief Devices, Drains
- Air Oxidation Units
- Waste Water Separators
- Storage And Transfer
- Other Process Units (specify)

Polymer And Resin Manufacture
- Catalyst Preparation
- Reactor Vents
- Separation of Reactants, Solvents And Diluents From Product
- Raw Material Storage
- Solvent Storage
- Other Process Units (specify)

Plastic Products Manufacture
- Mold Release
- Solvent Consumption
- Adhesives Consumption
- Other Process Units (specify)

Inorganic Chemical Manufacture
- Fugitive Leaks From Seals, Valves, Flanges, Pressure Relief Devices, Drains
- Storage And Transfer
- Other Process Units (specify)

Fermentation Processes
- Fermentation Tank Venting
- Aging/Wine or Whiskey
- Other Process Units (specify)

Iron And Steel Manufacture
- Coke Production
  - Coke Pushing
  - Coke Oven Doors
  - Coke Byproduct Plant
  - Coke Charging
  - Coal Preheater
  - Topside Leaks
  - Quenching
  - Battery Stacks
- Sintering
- Electric Arc Furnaces
- Other Process Units (specify)

Synthetic Fiber Manufacture
- Dope Preparation
- Filtration
- Fiber Extrusion - Solvent Recovery
- Takeup Stretching, Washing, Drying, Crimping, Finishing
- Fiber Storage - Residual Solvent Evaporation
- Equipment Cleanup
- Solvent Storage
- Other Process Units (specify)

Industrial Surface Coating

Large Appliances
- Cleaning And Pretreatment
- Prime Spray, Flow, Or Dip Coating Operations
- Topcoat Spray
- Coating Mixing
- Coating And Solvent Storage
- Equipment Cleanup
- Other Process Emissions (specify)

Magnet Wire
- Cleaning And Pretreatment
- Coating Application And Curing
- Coating Mixing
- Coating And Solvent Storage
- Equipment Cleanup
- Other Process Emissions (specify)

Automobiles And Light Duty Trucks
- Cleaning And Pretreatment
- Prime Application, Electrodeposition, Dip Or Spray
- Prime Surfacing Operations
- Topcoat Operation
- Repair Topcoat Application Area
- Coating Mixing
- Coating And Solvent Storage
- Equipment Cleanup
- Other Process Emissions (specify)

Cans
- Cleaning And Pretreatment
- Two Piece And Exterior Base Coating
- Interior Spray Coating
- Sheet Basecoating (Interior)
- Sheet Basecoating (Exterior)
- Side Seam Spray Coating
- End Sealing Compound
- Litography
- Over Varnish
- Coating Mixing
- Coating And Solvent Storage

Cans (continued)
- Equipment Cleanup
- Other Process Emissions (specify)

Paper
- Coating Operations
- Coating Mixing
- Coating And Solvent Storage
- Equipment Cleanup
- Other Process Emissions (specify)

Coil Coating
- Prime Coating
- Finish Coating
- Solvent Mixing
- Solvent Storage
- Equipment Cleanup
- Other Process Emissions (specify)

Fabric
- Coating Operations
- Coating Mixing
- Coating And Solvent Storage
- Equipment Cleanup
- Other Process Emissions (specify)

Metal And Wood Furniture
- Cleaning And Pretreatment
- Coating Operations
- Coating Mixing
- Coating And Solvent Mixing
- Equipment Cleanup
- Other Process Emissions (specify)

Flatwood Products
- Filter
- Sealer
- Basecoat
- Topcoat
- Inks
- Coating Mixing
- Coating And Solvent Storage
- Equipment Cleanup
- Other Process Emissions (specify)

Plastic Products
- Cleaning And Pretreatment
- Coating Operations, Flow, Dip, Spray
- Coating Mixing
- Coating And Solvent Storage
- Equipment Cleanup
- Other Process Emissions (specify)

Large Ships
- Cleaning And Pretreatment
- Prime Coat Operation
- Topcoat Operation
- Coating Mixing
- Coating And Solvent Storage
- Equipment Cleanup
- Other Process Emissions (specify)

Large Aircraft
- Cleaning And Pretreatment
- Prime Coat Operation
- Topcoat Operation
- Coating And Solvent Storage
- Equipment Cleanup
- Other Process Emissions (specify)

Miscellaneous Metal Parts And Products
- Cleaning And Pretreatment
- Coating Operations, Flow, Dip, Spray
- Coating Mixing
- Coating And Solvent Storage
- Equipment Cleanup
- Other Process Emissions (specify)

<u>Other Solvent Use</u>

Dry Cleaning
- Perchloroethylene
- Petroleum
- Other

Degreasing
- Open Top Vapor Degreasing
- Conveyorized Degreasing - Vapor
- Conveyorized Degreasing - Cold Cleaning

Solvent Extraction Processes

Adhesives
- Adhesive Application
- Solvent Mixing
- Solvent Storage
- Other Process Emissions (specify)

Grahic Arts
- Letter Press
- Rotogravure
- Offset Lithography
- Ink Mixing
- Solvent Storage

Waste Disposal

Municipal Waste
- Combustion
  - RDF
  - Mass Burn
  - Co-fired
  - Other
- Landfills

TSDFs
- Lagoons
- Tanks
- Mixing
- Aeration
- Landfills
- Other

POTWs
- Tanks
- Lagoons
- Aeration
- Mixing
- Digestion
- Other

ITWs
- Tanks
- Lagoons
- Aeration
- Mixing
- Digestion
- Other

Industrial Boilers
- Co-firing (specify major substances and co-firing fuels, such as oil, gas, coal, etc.)

APPENDIX B

EPA Checklist For Reviewing Post-1987 Ozone SIP Emission Inventories

REVIEW OF POST 1987 O_3 SIP EMISSION INVENTORIES

Developed By:

Monitoring and Reports Branch
Technical Support Division
Office Of Air Quality Planning And Standards

AREA: _____

RECEIPT DATES:

_____ BY:

_____
(name, Organization)

_____ BY:

_____
(name, Organization)

_____ BY:

_____
(name, Organization)

_____ BY:

_____
(name, Organization)

REVIEW COMPLETION DATES*:

_____ BY:

_____

_____ BY:

_____

_____ BY:

_____

_____ BY:

_____

REGION CONTACTS:

_____

_____

STATE CONTACTS:

_____

_____

*Attach copies of review correspondence.

Enclosed is a checklist developed by the Monitoring and Reports Branch (MRB) of the Technical Support Division (TSD), Office of Air Quality Planning and Standards (OAQPS), to evaluate the basic adequacy of the Post 1987 O_3 State Implementation Plan (SIP) emission inventories. The primary objective in using this checklist is to review each inventory for national consistency. A secondary objective is to assist the Regional Offices in their evaluation of the technical soundness of each data base.

OAQPS will focus its reviews on the draft emission inventories to be submitted before SIPs are included. As such emphasis will necessarily be placed on the base year inventories due at that time.

Upon completion of this review process, OAQPS will send a copy of the completed checklist to the designated Regional Office ozone SIP emission inventory contact. Please direct any correspondence regarding this checklist to E. L. Martinez, Chief, Criteria Emissions Section, Mail Drop 14, or call him at FTS 629-5575.

CHECKLIST OF '87 O$_3$ SIP INVENTORIES

Note: "Post '87 requirements" refers to Emission Inventory Requirements For Post '87 Ozone State Implementation Plans.

1. VOC/NO_x/CO Summary Tables

   a. Does the submittal contain completed VOC/NO_x/CO summary tables, per Table 1 in Post '87 Requirements, for:

      i. the base year inventory (draft inventory)?

      |_| Yes |_| No

      ii. the base line projection year inventory (final inventory)?

      |_| Yes |_| No

      Comment? _____

_____

_____

   b. If the suggested format is not followed, is a format used that contains equivalent information?

      |_| Yes |_| No

      Comment? _____

_____

_____

   c. In the VOC/NO_x/CO summary tables, is the attainment year specified?

      |_| Yes |_| No Year? 19___

      Comment? _____

_____

_____

d. In the VOC/NO_x/CO summary tables, is the point/area source distinction made?

☐ Yes ☐ No

Comment? _____

_____

_____

e. In the VOC/NO_x/CO summary tables, have the emissions been seasonally adjusted?

☐ Yes ☐ No

Comment? _____

_____

_____

f. Have the suggested RACT source category distinctions been maintained?

☐ Yes ☐ No

Comment? _____

_____

_____

g. Are emissions reported as reactive VOC?

☐ Yes ☐ No

Comment? _____

_____

_____

h. Is the geographical area specified?

☐ Yes ☐ No

Comment? _____

_____

_____

2. Point Source Listing

a. Does the submittal contain a point source listing, per Table 2 in Post '87 Requirements, for the base year?

|_| Yes |_| No

Comment? _____

_____

_____

_____

b. Are the principal operations specified with corresponding emission totals?

|_| Yes |_| No

Comment? _____

_____

_____

_____

3. Documentation - General Considerations

a. Is there documentation accompanying the summary tables and point source listing?

|_| Yes |_| No

Comment? _____

_____

_____

_____

b. Does the documentation specify who did the inventory?

|_| Yes |_| No

Comment? _____

_____

_____

_____

c. Does the documentation define the area covered by the inventory?

☐ Yes ☐ No

Comment? _____

_____

_____

d. Does the documentation tell how nonreactive VOC were excluded from the emission totals?

☐ Yes ☐ No

Comment? _____

_____

_____

e. Does the documentation describe how the seasonal and weekday adjustments were made?

☐ Yes ☐ No

Comment? _____

_____

_____

4. Specific Documentation - Point Sources

a. Are point source cutoff levels defined?

☐ Yes ☐ No

What are they? _____ Do they exceed 25 kg/day (10 TPY) for VOC or 250 kg/day (100 TPY) for NO_x or CO?

☐ Yes ☐ No

Comment? _____

_____

_____

b. Has the inventory been scaled up in some manner to account for points emitting less than the cutoff level(s)?

|_| Yes |_| No

Comment? _____

_____

_____

c. Do all major point source categories appear to be included?

|_| Yes |_| No

Have all VOC and NO_x emission source categories in NAPAP inventory been addressed in SIP inventory?

|_| Yes |_| No

Comment? _____

_____

_____

d. Have material balance techniques been used to estimate VOC emissions from solvent-using facilities?

|_| Yes |_| No

Have source test results been used to identify emissions?

|_| Yes |_| No

Typical age range if source test data:

Comment? _____

_____

_____

e. Are summer conditions of higher temperatures (and appropriate Vapor Pressures for gaoline) reflected in the VOC emission estimates made for petroleum product marketing and storage operations?

|_| Yes |_| No

Do other volatile organic chemical storage calculations use appropriate temperature and throughput assumptions?

|_| Yes |_| No

Comment? _____

_____

_____

f. Are the latest (through Fourth Edition, Supplement A) AP-42 emission factors used for calculating VOC emission estimates for petroleum product marketing and storage operations?

|_| Yes |_| No

Have "gapfilling" emission factors from NAPAP been used?

|_| Yes |_| No

Comment? _____

_____

_____

g. Is the SIP emission inventory produced from a computer data base?

|_| Yes |_| No

If so, what emission inventory system is used? (e.g., SAM/EIS/P&R) _____. Are example emission calculations shown for several major point source categories?

|_| Yes |_| No

Comment? _____

_____

_____

5. Specific Documentation - Area Sources

a. Are all of the major area sources listed in Table 4.1-1 of Procedures For The Preparation Of Emission Inventories For Volatile Organic Compounds, Volume I, (Third Edition) included in the inventory?

|_| Yes |_| No

Comment? _____

_____

_____

b. When certain facilities within one of the source categories listed in Table 4.1-1 are covered as point sources, have the associated emissions been subtracted from those emissions estimated for the corresponding area source category?

|_| Yes |_| No

Comment? _____

_____

_____

c. Have the per capita factors from Procedures For The Preparation Of Emission Inventories For Volatile Organic Compounds, Volume I, (Third Edition) been used to compute emissions?

|_| Yes |_| No

If not, have techniques been used that appear to be technically sound, and are these alternate methods documented?

|_| Yes |_| No

Comment? _____

_____

_____

d. Has local activity levels information been used?

|_| Yes |_| No

Comment? _____

_____

_____

e. Does gasoline usage fall in the range of 400 to 800 gallons per capita per year?

|_| Yes |_| No

Are emissions included from underground tank breathing and trucks in transit?

|_| Yes |_| No

Comment? _____

_____

_____

f. Have the technical points in Attachment I of the check list (regarding per capita factors) been considered?

|_| Yes |_| No

Comment? _____

_____

_____

6. Specific Documentation - Highway Vehicles

Is the following information reported?

a. Description of procedures and models used to estimate base year and future year transportation parameters.

|_| Yes |_| No

Comment? _____

_____

_____

b. Description of the travel data base and any subsequent updates. When possible, estimates of the degree of accuracy and other statistical parameters should be included.

☐ Yes ☐ No

Comment? _____

_____

_____

c. Description of traffic counting programs. Estimates of the degree of accuracy of VMT estimates based on traffic counts should be included.

☐ Yes ☐ No

Comment? _____

_____

_____

d. Description of methods used to estimate vehicle speeds. Special speed studies should be documented.

☐ Yes ☐ No

Comment? _____

_____

_____

e. Description of methods for estimating traffic parameters (VMT, speed, etc.) for local (off-network) traffic.

☐ Yes ☐ No

Comment? _____

_____

_____

f. Description of methods used to estimate vehicle hot and cold start soak emissions.

|_| Yes |_| No

Comment? _____

_____

_____

g. Description of methods used to calculate emissions, including a description of how data were aggregated and emission factors applied.

|_| Yes |_| No

Comment? _____

_____

_____

h. Description of how other emission parameters (such as vehicle age distribution, average annual miles driven by model year) were obtained.

|_| Yes |_| No

Comment? _____

_____

_____

7. Specific Documentation - Projections

a. Does the inventory submittal specify how growth is incorporated into the baseline projection inventory?

|_| Yes |_| No

Comment? _____

_____

_____

b. Are the population projections used in the SIP inventory consistent with those projections used in water quality planning and design of wastewater treatment facilities?

☐ Yes ☐ No

Comment? _____

_____

_____

c. Are reasonable surrogates used for "growing" activity levels and emissions, such as those indicators shown in Procedures For The Preparation Of Emission Inventories For Volatile Organic Compounds, Volume I, (Third Edition)?

☐ Yes ☐ No

Comment? _____

_____

_____

d. Does the baseline projection take into account "on-the-books" control measures, specifically those in earlier SIPS (1979, 1982)?

☐ Yes ☐ No

Comment? _____

_____

_____

e. Are specific examples shown of how projections were made for specific source categories?

☐ Yes ☐ No

Comment? _____

_____

_____

f. Are projections for very large VOC emitters generally considered on a plant-by-plant basis rather than in aggregate?

|_| Yes |_| No

Comment? _____

_____

_____

8. Specific Documentation - Quality Assurance

a. Has a quality assurance effort been made?

|_| Yes |_| No

Comment? _____

_____

_____

b. Were the RACT or other industrial directories compared with the point source file to determine the possibility of missing sources?

|_| Yes |_| No

Comment? _____

_____

_____

c. Were emissions data and point source listings compared with other emissions inventories (i.e., 1985 NAPAP)?

|_| Yes |_| No

Comment? _____

_____

_____

d. If the emission inventory was developed from a computer data base (mainframe, mini, micro, or PC), are the emission factor files used in calculations referenced (i.e., AP-42, source specific test, other)?

|_| Yes |_| No

Are nonhighway area source inventory equations used in the file documented or referenced?

|_| Yes |_| No

Comment? _____

_____

_____

e. Are any data reasonableness checks made on emissions (i.e., comparison with national or regional averages)?

|_| Yes |_| No

Comment? _____

_____

_____

f. Do the base year travel and emission estimates fall within the ranges presented in Guidelines For Review Of Highway Emission Inventories For 1982 SIPs (EPA-400/12-80-002)?

|_| Yes |_| No

Comment? _____

_____

_____

Attachment I

Points Regarding Use Of Per Capita Factors

National per capita factors are available in Volume I to estimate (or crosscheck) reactive VOC emissions from the following area source categories.

- Small cold cleaning (degreasing) - 3 lb/capita-yr

  Note: Open top vapor and conveyerized cleaners are not covered by this factor.

- Dry cleaning - 1.2 lb/capita-yr (commercial plants)
  0.3 lb/capita-yr (coin-op plants)
  1.5 lb/capita-yr (total)

  Note: Industrial plants are not covered by these factors.

- Architectural surface coating - 4.6 lb/capita-yr

  Note: This includes thinning and cleanup solvent.

- Automobile refinishing - 1.9 lb/capita-yr

  Note: Where employment information for SICs 7531 and 7535 is available, EPA recommends applying a factor of 2.6 ton/employee-yr to employment rather than applying a per capita factor.

- Graphic arts (printing) - 0.8 lb/capita-yr

  Note: This per capita factor covers < 100 ton per year solvent users, and assumes ≥ 100 TPY sources are covered as point sources.

- Miscellaneous consumer/commercial solvent - 6.3 lb/capita-yr

  Note: This factor is not a catchall to compensate for missing industrial solvent use not covered in the point source inventory.